Space Weather Forecast

Issued on Friday, 25 August 2023 at 01:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of G1 Minor Storms early day 1 (26 Aug). Chance of isolated M-flares throughout (R1-R2 Blackouts).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with the largest flare a common class flare from a small sunspot in the northwest. There are a total five sunspot region on the disc. The most complex is a modestly sized region in the southeast area containing two opposite polarity areas within the same individual spot, but showing very little activity. A further spot in the northeast is the largest on the disc, but exhibited decay within its trailer portion. The other spots were also smaller mature, unipolar spot, including the source of the largest observed flare.

No Earth-directed CMEs (coronal mass ejections) have been observed. The common class flare previous mentioned did cause some disturbance to the Sun's corona, but no CME has been detected. A CME was observed from the previous a weaker common class flare however, but this was from over the northwest limb.

Solar Wind / Geomagnetic Activity: A transition into the fast wind of from a coronal hole was observed. Solar wind speeds were slightly elevated at 400-440km/s until around 24/1500 UTC, then rose gradually to peak just over 500km/s by 24/1820 UTC, and then persisted slightly elevated 460-500km/s. The interplanetary magnetic field (IMF) was mainly weak but briefly rose to Moderate around 24/1600 UTC, before declining to persist at weak levels from 24/1630 UTC. The north-south component was mainly positive (northward) until 24/1200 UTC, then variable and Moderate in both direction at times until 24/1740 UTC, before then easing, but remaining mostly negative. Geomagnetic activity remained was Quiet at first (Kp 0-2), but became Unsettled (Kp3) from 24/1500 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar Activity is expected to be generally Low, but with a chance of isolated Moderate class flares. These most likely from the complex sunspot in the southeast, or the larger region in the northeast.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. Ongoing coronal hole sourced far wind is expected at first with winds around 500km/s. This easing day 1 and 2 (25-26 Aug) with a further enhancement then possible from further coronal holes either late day 2 or day 3 (26-27 Aug). Unsettled to Active geomagnetic activity is forecast at first, with a slight chance of G1 Minor Storm intervals. This easing early day 1 (25 Aug) to become mainly Quiet with isolated Unsettled intervals. The arrival of further faster winds late day 2 or day 3 (26-27 Aug) is then likely to increase activity to Unsettled with Active intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background with no solar radiation storms expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	5	10	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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